



U.S. Department  
of Transportation

**Pipeline and  
Hazardous Materials Safety  
Administration**

JUL 14 2005

400 Seventh Street, S.W.  
Washington, D.C. 20590

Mr. Christopher R. Sharp  
Technical Consultant  
RCS, Inc.-Ohio  
950 Taylor Station Road  
Suite M  
Gahanna, OH 43230

Ref No.: 05-0098

Dear Mr. Sharp,

This is in response to your letter dated March 7, 2005, requesting clarification of special provision A102 and § 173.159 of the Hazardous Materials Regulations (HMR; 49 CFR Parts 100-185). Specifically, you request a letter confirming that your equipment, with a nonspillable battery and solid cathode primary lithium battery installed, is not subject to any other requirements of the HMR and may be transported aboard a passenger carrying aircraft, provided the nonspillable battery and outer package are marked "NONSPILLABLE" or "NONSPILLABLE BATTERY" in accordance with 173.159(d) and the primary cell lithium battery meets special provision A102.

Your understanding is correct. In accordance with special provision A102, primary cell lithium batteries that are contained in equipment and comply with the requirements of the special provision A102 may be transported aboard passenger carrying aircraft. In addition, they are excepted from all other requirements of the HMR, including the requirement in § 173.185(b)(5) and (c)(4) to mark the package with the statement, "PRIMARY LITHIUM BATTERIES—FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT."

Nonspillable batteries that meet the provisions in § 173.159(d) are not subject to the HMR provided the nonspillable battery and the package are plainly and durably marked "NONSPILLABLE" or "NONSPILLABLE BATTERY."

I hope this information is helpful. Please contact us if you require additional assistance.

Sincerely,

John A. Gale  
Chief, Standards Development  
Office of Hazardous Materials Standards



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173.159  
173.185



Supko  
\$173.159  
\$173.185  
Batteries  
05-0098

March 7, 2005

United States Department of Transportation  
Research and Special Programs Administration  
400 7th Street SW  
Washington D.C. 20590-0001

Attn: Edward Mazzullo – Director, Office of Hazardous Materials Standards

***RE: Letter of Interpretation under the exception of wet non-spillable batteries and primary lithium batteries contained in equipment, with less than 1.0 g of Lithium from Hazardous Material Regulations***

Dear Mr. Mazzullo,

The following requests a letter of interpretation regarding the application of the exception of wet batteries from the Hazardous Material Regulations under 49 CFR 173.159 and the exception of primary lithium batteries contained in equipment with less than 1.0 g of Lithium under 49 CFR 185 and special provision A102 from Hazardous Material Regulations.

### **Non-Spillable Wet Batteries**

The Hazardous Materials Regulations except non-spillable wet batteries from DOT requirements under 49 CFR 173.159.

A nonspillable wet electric storage battery is excepted from all other requirements of 49 CFR 173.159 under the following conditions:

- (1) The battery must be protected against short circuits and securely packaged;
- (2) For batteries manufactured after September 30, 1995, the battery and the outer packaging must be plainly and durably marked "NONSPILLABLE" or "NONSPILLABLE BATTERY"; and
- (3) The battery must be capable of withstanding the following two (2) tests, without leakage of battery fluid from the battery:
  - **Vibration test.** The battery must be rigidly clamped to the platform of a vibration machine, and a simple harmonic motion having an amplitude of 0.8 mm (0.03 inches), with a 1.6 mm (0.063 inches) maximum total excursion must be applied. The frequency must be varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return must be traversed in 95 ± 5 minutes for each mounting position



(direction of vibrator) of the battery. The battery must be tested in three (3) mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

- *Pressure differential test.* Following the vibration test, the battery must be stored for six hours at  $24^{\circ}\text{C} \pm 4^{\circ}\text{C}$  ( $75^{\circ}\text{F} \pm 7^{\circ}\text{F}$ ) while subjected to a pressure differential of at least 88 kPa (13 psig). The battery must be tested in three (3) mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.
- (4) At a temperature of  $55^{\circ}\text{C}$  ( $131^{\circ}\text{F}$ ), the battery must not contain any unabsorbed free-flowing liquid, and must be designed so that electrolyte will not flow from a ruptured or cracked case.

### **Primary Lithium Batteries**

The Hazardous Materials Regulations under 49 CFR 173.185 and Special Provision 102, except primary lithium batteries contained in equipment with a liquid cathode with an aggregate quantity of 1.0 g or less of lithium content from all DOT hazardous materials requirements including the "PRIMARY LITHIUM BATTERIES--FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT" marking requirement under 49 CFR 173.185 and may be transported by passenger aircraft.

According to Special Provision A102, Primary (non-rechargeable) Solid Cathode lithium batteries or cells contained in equipment are forbidden for transport aboard a passenger carrying aircraft unless the battery or cell complies with the following requirements:

1. Each cell with a solid cathode may contain not more than 1.0 g of lithium content;
2. Each battery with a solid cathode may contain an aggregate quantity of not more than 2.0 g of lithium content;
3. Cells and batteries must be packed in such a way so as to prevent short circuits and must be packed in strong packagings, except when installed in equipment;
4. If when fully charged the aggregate lithium content of the anodes in a solid cathode battery is more than 1.0 g, then the battery may not contain a liquid or gas that is a hazardous material according to this subchapter unless the liquid or gas, if free, would be completely absorbed or neutralized by other materials in the battery;
5. The package contains no more than the number of lithium batteries or cells necessary to power the intended piece of equipment;



6. The equipment containing the battery or cell is packed in strong packaging;
7. The net weight of the package does not exceed 5.0 kg. Packages complying with the requirements of this special provision are excepted from all other requirements of this subchapter.

RCS, Inc.'s interpretation of the Primary Lithium Battery and Wet-Non-Spillable battery requirements are as follows:

Please find the list of Baxter Pharmaceutical's equipment that contain one solid cathode primary lithium battery:

<b>Name of Equipment</b>	<b>Lithium Content of Battery</b>	<b>Wet, Non-Spillable Battery</b>
Colleague	0.6g	Yes
FloGard	0.15g	Yes
AP2	0.06g	No
Ipump	0.06g	No
6060	.05g	No
Syndeo	0.03g	No
HomeChoice (Tadiran Battery)	0.55g	Yes
HomeChoice (Saft Battery)	< 0.7g	Yes
HomeChoice (Maxwell Battery)	0.52g	Yes
HomeChoice (Sonnenschein Battery)	0.55g	Yes
Sigma	< 1g	No
Arena/System 1000 (Sony Battery)	0.15g	No
Arena/System 1000 (Panasonic)	< 1g	Yes
Meridian (Tadiran Battery)	0.3g	Yes
Meridian (Tadiran Battery)	0.13g	No
BM14a	< 1g	No
Quantum PD	< 1g	Yes
Accura (Varta Battery)	0.087g	Yes
Accura (Rayovac Battery)	0.156g	Yes
Alyx	<1 g	Yes
Amicus	<1 g	Yes
Auto-C	Does Not Contain a Lithium Battery	Yes
AMS	<1 g	No

The packaged equipment above contains no more than the number of lithium batteries necessary to power the intended piece of equipment. The equipment above is packed in strong packagings and the net weight of the package does



not exceed 5.0 kg. None of the batteries used in the Baxter equipment contain a liquid or gas that is a hazardous material.

The wet, non-spillable batteries within all Baxter equipment is protected against short circuits and securely packaged during transportation. The wet, non-spillable batteries within all Baxter equipment are capable of withstanding the Vibration Test and Pressure Differential Test, as set forth by DOT, without leakage of battery fluid from the batteries. At a temperature of 55°C (131°F), the wet, non-spillable batteries within all Baxter equipment do not contain any unabsorbed free-flowing liquid, and are designed so that electrolyte will not flow from a ruptured or cracked case.

All Baxter equipment listed above may be legally transported by passenger or cargo aircraft when transported as previously mentioned. When fully charged none of the batteries in the equipment contain an aggregate of more than 1.0 gram of Lithium. Packages containing the aforementioned equipment need not be marked "PRIMARY LITHIUM BATTERIES--FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT" when transported. Wet, non-spillable batteries in Baxter equipment, along with the outer packaging must be marked, "NONSPILLABLE" or "NONSPILLABLE BATTERY." Due to the fact that packages containing Baxter Equipment and the batteries within the equipment comply with the requirements of special provision A102, and 49 CFR 173.159, they are excepted from all other requirements of the Hazardous Materials regulations.

Upon determination and completion of a letter of interpretation, please reply to:

Christopher R. Sharp  
Technical Consultant - RCS, Inc.-Ohio  
950 Taylor Station Road, Suite M  
Gahanna, OH 43230

Your cooperation and timeliness are greatly appreciated.

Sincerely,

Christopher R. Sharp  
Technical Consultant  
RCS, Inc.-Ohio  
614-552-8530 x 32  
crsharp@4rcs.com